Introducting Lectoine fu 1815 fames Ruch 11.0. Lecture for 1815

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## RIDGWAY BRANCH.

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COMMUNITER BONA PROFUNDERE DEORUM EST.

I have come before you to deliver an introduction to the lectures of the bate In Bongamin Rush on the Institute and Praction of Medicine, on thus addressing you I do not feel as if I were purforming a voluntary tack It is a duty. By the favor of the author of these between I have been made the popular of them, and I should be unworthy of the brust if I were not by an ende avour the extend the truthy Hey contain to sim of some slender meta: tion of the exection of him who used so much industry to originate and teach theme. The pre sont time has been call'd with a sentiment of reproach the age of between, on thus adding to the number, I ful disposed to question the advantages that are said to result from their made of instruction and to ask if greater benefits might not be derived from the more deliberate opportunity which books

when a body floats in water it affects a particular position, and this position he is such, that the line which gains the centre of granity of the hody and the centre of M gravity of the immersed part is always By Welkinson a thin Man was taken fue fieet two inches

afford for receiving knowledge and reflecting upon it than can take place in the hasty trans setions of oral discourse - The huseness of pub: lie lectures is like the other partices of the world note which alused have creft by the interest of men and the overseght of time. Their advantage was real and indispensible to the student at their institution They had their origin with teachers who had knowledge to communicate and who had not the mulliplied means of The press to extend that knowledge to other times and places. Frenting has changed the made of many acts and books have now be come the common and sufficeents instructory of the world. To this remark there are some exceptions. The element, of all knowledge ment be addreped to the senses, and in medical study there are some branches so absolutely alementary that an attempt At teach them in any other way than by

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exhibiting their object, to the senses would be all in wain. Such branches are anatomy The experiments of chemistry, The operations of Lungery and Materia Medical where it is properly or usefully taught by shewing and not merely discribing the sensible que: lilies of medicines ... Here subject with he more easily understood and more im = prefilely marked by the demonstrations of a lecturer. am other accasion on which be tures may be useful is when they contain knowledge or peculiar opinions which can: not be obtained from any other source. I need searely say with what plea & dain your attention. The between you will hear contain not only the seccord of as much experience as has fallen to the lot of any tracker, but they contain original deauctions from this experience and an

entabling their start of the mountained 0 ell who were wind to make him has the of the of the experience of the second of the M of deep game and Marked Me will be have the le production of which the description of the state of 22 04 1 non early and whool and deap his a an a letter ha aller overson on when I le M that may be inside it to be that you have 2 it and the second will be a first of the second of the sec de o read search save with which of the se of lu in a season attended the later of the season of the an de ga many and a second and a second representation of the

application of principles thus ordered to the purposed of medical practice. That you May Inaw the opinions contained in these lectures are original and unful I have only to state that the trial and conviction of their truth throwant a whole country has were and powerful an apportation as was wer raised against any movation and that with the danble operation which meany touther have of offending and convin: eing, they have by the same persons here beoth condemned and practiced. I have said the object of the lecture of will read to you is to theach the Institutes and practice of Medicine - The systematic division that has been make of there too great branches of medical study is as follow The Institutes have been separated note Phisiology which treat of all the actions

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of the hady in a healthy state: Sugaine which lays down the rules for me scroing these healty actions; Pathalagy which discribes the actions of the hady in a diseased state, and There penties which points out in a general way The qualities of medicines for the cure of this diseased state. The Practice of medicinex en ters into the detail of all the general pulis laid down in Cathalagy and Francheutics The separation of Institutes and Bactise of medicine, is no more then than that xivision which every seines admits inte a specie: latibe and practical part - Phisiology on the sint franch the Smother, among other actions of a healthy hady, treats of the form and uses of the muscles and paints out the made of their operation in the exercises of walking sunning bearing and Swimming and I have chasen for this introducting

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betwee to enter jute the detail of the Phoiols gecal action of the exercise of I wimming Man is almost the only animal that cannot swim naturally, and he is almost the only animal which by his art, can over. come those ne expeties to which his structure Seams to limit aim. It be comes then a Subject of Whilasophical enquirey why man Eamnot swim materally and by what ma nagement of his hody he can remedy this ha tural meapacity. The whole art of swemming depends upon the bady being of less specific gravity than water, and upon the proper pos Sotion and muscular exertion of that body. and first of the Boy mey necessary for swimming-The human body is in general so much lighter Than an equal bulk of water that it will remain suspended at the surface when immen

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Sed in it - This augurence of gravity will !. appear epential to the act of Swimming, If we consider that when animals mave in Iluian lighten than their bodies, there is a two fold exertion necessary one to give them a too. : prefixe motion Amo' it the other to prevent their sinking. Birds move this the air which is much lighter than their bodies by me ans of this two fold ration of suspension and progression, and the great map of flish on the beaut of there animals shows the strong muscular power applied to the wings for the laborious exercise of flying. But man has proportionally to hiras very tette stingth, enough indeed to mave him slowly This the water when he is supported by its gocator weight, but far short of that vait pawer whe would be needfang for his support and for. grap if the water were much lighter than his

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body If the muscular pawer of man were much enere and beyond its mesent limit then The weight of the bady might be greater than water, for this additional strongth would sufe. port the begin the highler shired, and Severnming wanta then he efected upon the principles of The art of Flying . In or arn that man may swim then his body should be somewhat highter Than an equal bulk of water, that it may the supported on the surface, and the oxperi ence of divers proves that it is so. They cannot dive to great depths exceptibling we thank in: Occasing their weight by some heavy body, or by giving themselves a powerful importers by a fall from a hight, on by strong exertion in swemming dawnwards, nor ear they hemain beneath except they sign grant stoms on and or something permanent to retain Them . - But this subject of the Specific gravity cut wid Core 1220 The and the trach 3-2 tien ·jes lua 4: Ž. trie

of human badeis has been exhibited with 9 more pricise detail by Mr. Robertson in the fiftieth bolume of the Phil: Fransaction. He emplayed a cistern sin feet and a half in length, thirty inches wede and thirty makes dup. He mated the weight of the man; the hight of the water in the sistem he fore immersion; the hight the water rose to after immersion, the then calculated the weight of The water which they rose upon the immersion and the hulk of this being exactly a qual to the bulk of the body, its weight when compared with the weight of the body gave the relative gravities of the body and waters. Irone a to hular wien which he has given of all there pan tienlars in the cases of ten men whom he sul-= jeded to his experiment, of appears that one · was one pound heavier than an equal hulk of displaced water and consequently sunk Ewo were of equal quarity with their respec time wilks of displaced water and therefore

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would remain immersed at any point in 10 it, one was faurteen pounds lighter, and want sine one was, eighten bounds lighten one was tventy facer. twenty fine Two - Thirty and Therty two pouros lighter than their superties bulks of displaced water. - It appears pone there experiment, that the specific gravity of men bear no regular proportion to their hights. for of two of the subject, each of whom was time feet four inches in hight, one was twenty and the other thirty pounds lighter than the wa ten - It appears also that their specific gravities bear no regular proportion to their hulk, for of two of the subjects, each of whom displaced the same quantity of water consequently having the same bulk, one was of the same weight as the displaced water and the other towardy four pouros lighten .- as the specific granty

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of a man then avainot depend upon the 11 hight or bulk of his whole hody, the cause of The variation must be latter for in the relative size of the different parts of it, for there parts have ristorent specific granties. The head is the greatest and much suferior to water, the gravity of the limby is less than the he it but greater than wa ter, the body is about the some as water, and the chest is the lightest part, how the chest is so much lighter than water as to countertratance the greater gravity of the head and limbs, so that the whole body when immersed is lighten then the mater. - There is a common notion that fat mon are lighter in the water than thank of a spane or sunder form. analogy would had us to believe it, the I have met with no accurate absentations or experiments that make it certain. This view of the relative granty of the parts of the lady may en: able us to judge of the bayancy of a man

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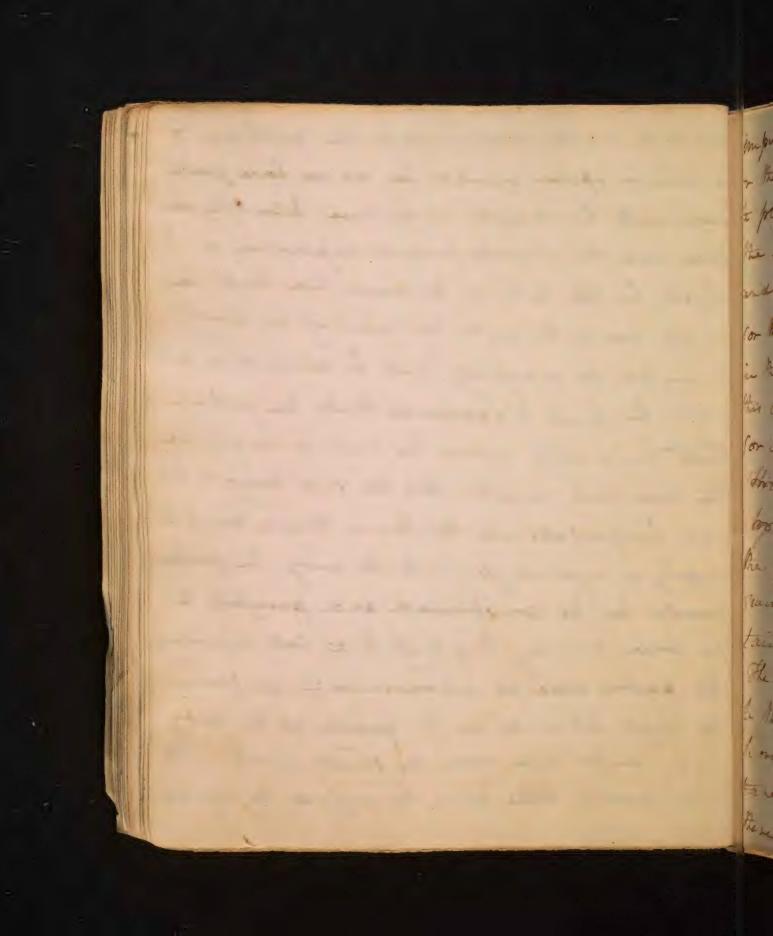
by his form. If the limbs and he ad be small 12. and the chest large or the whole body fat, he well flaat easily. near the surface of the water Realisting that I am state source dring morely the boy any of the body from its greater livity Than water with and any aid from muscular exertion, It is proper to consider in what manner its with and the afternoon in the weight of it is beral parts will course to the flact. - The centre If granity of the human hody is in the middle of a line arown a crops the hips, and this centre which refraesents the weight of the whole mays is became the cheet or lightest part, Therfore when the body is unmoved in the water the chest will be main above and the hips will de eard tet the start, sinking hereath the surface according to its specific granity. Thus recurring to the fre =

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ceding experiments, the man whose weight 3. was one paind more than an aqual bulk of water would sink to the bottom, Those who were lighten would remain at the surface with as much of the body above it as is equal to The difference of the weight of the body and the weter, and this part will always be the upper part of the lead of me suppose the head of a In an to unigh twenty fine pouros, then that one who was twenty fine pounds tighter than The water could last with the sobole head showe the surface. But such a builty is wordy to be met, and the budy generally sinks tett The mater vives to about the hight of the eyes or above them . -I have thus fan considered the first spential quality for swimming the lively of the lodg. but this alone would not enable a man to

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continue in the water. - Since the position 4 he would apune would be as we have just seen with his manth and have below the ser face and this would prevent respiration on which his life depends. In order then that he might live in the weater by means of his levely it would be necessary that he should so far meline his head backwards that the portion when here aincal about the surface might be The nose and mouth, But the face being in this care horizontal once the head thrown back to heavy a night angle with the bady, the postine would be too constrained and painful to be borne for any length of times, but supposing this pasture were no inconvenience, yet from the dight difference in the gravity of the body and weather and from the small chastion the Jane would have alone the surface the sughtest



Impulse such as the movement of a limb 15 or the mere stroke of a mane would be sufferent to plunge the hotz so frequently and so far helow The surface as a disturb the breathing very much and finally to autroy it - another cause then Sor the support of man in or acr that he may live in the water, must be saught here dus his livily and this cause will be found in the second epential Sor Sueimming a proper Muscular exertion. this successors formions since to in this polation too the station of the Amarchy. This he ard includes The consideration of the proper paretin for Sucuming since this position is man. trind only by musual ar exertion. The parition which offers greatest resertance he the weent of the hody in water is the the oregantal one, and That of last never: time the upright, for in these opposite care There is the largest and squallest papille sur

in vian the back but us suppose truc 1. ry a the

face aireally opposed to the mater in it, 16 pasage thro it - But we have seen that the budy when immerced falls to the represent pose how, to least advantageous for support In order therefore to bring it to the proper hose gonese porture The water below much he struck by the feet, this elevaly the linely to The surface and set the whole hoty to the no goulas line. But the shake of the fut me. This setuation waseld not prevent the limby Sonking again to the upright acception, The horizontal line then must be preserved by other means. There are a strong contraction of the murch of the back and hips by which there parts are kept in a rigid line with the chest. haw the chest being The boyant part of the body and flanting at the surface, The inforcion parts are made by this regedity to project as it were from

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the Chest as a fixed point, and thus the 1%. horizontal portione is mantained at the sur Jace - I wish what I have here remarked of the Back and Hips being kept in a regid line with the Chest to be remembered since I shall more than once necur to it and I hope to show that upon this more than whom any other point the art of Sweim ming aspends .. In heating of the hog. ancy of the hady I suid a man could not line in the upright position in mater, he = cause Le could ruep the head thrown kuck so for that the part which remaind above The surface might be the nose and month But in the horgantal line to which he is have supposed to be, this difficulty no longer esist, and the smallest reflection of the head will enable him to be athe with perfect free dom. Since then the hoty to

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extended on the back along the surface 18 has most boganey he cause nearly all the budy is immersed and as the small portion which almains please is the face which al land resperations, It fall aws that the best position for swemming would be for a mon to Amow himself on the back, bring the listy stright at the surface ma by shitting with The andy to mane this the water. - But this made of swimming on the back the the carriest to be learned if the list were taken up In thetically, get from the slowings of the mation in this posture, and the violence dose offers to the habity of man, by his thus moving in the apposite airection to which he lasted and his lying on the back, it is greeally the last acquired or practiced. - Sim ming is always beama by turning from

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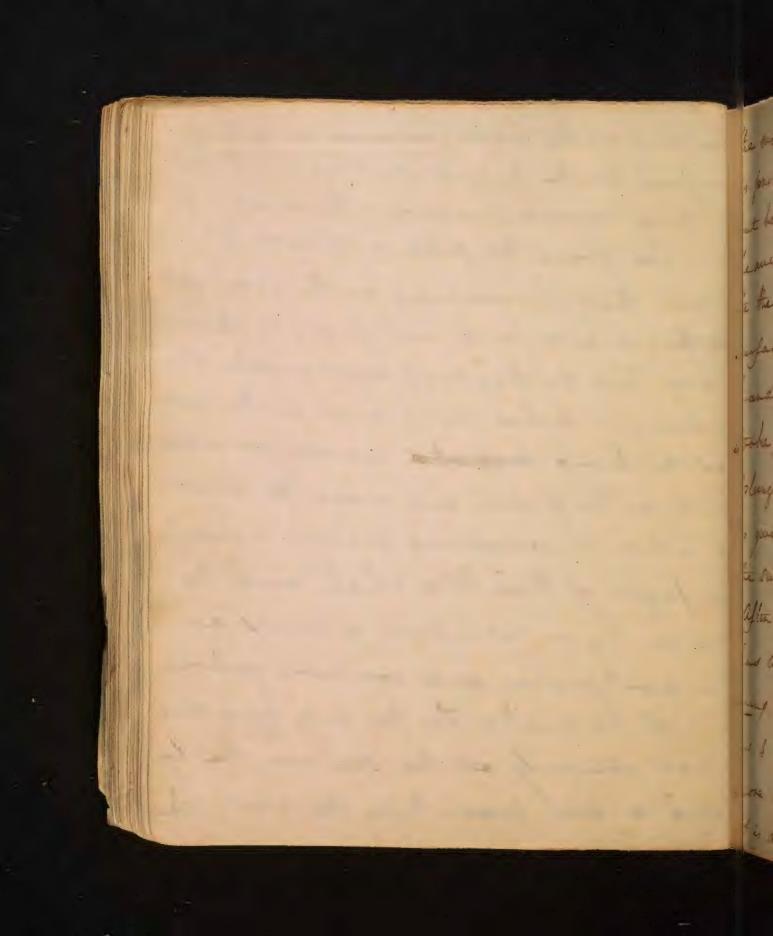
This supine to the prone pasition, or 19 with the breat upon the water. Now this prone position immediately dimenutes the Boy andy of the bady, for so the time when sufaines was of the same gravity with the water, from a small part only being alrows the surface and as respiration would continue four that part bung the mouth and hose, when the body is turned to the prose position, it becomes heavier Than water, from the importaitity of treathing in this situation without keeping the whole head showe the surface hence arrises the neceptly of muscular coortion in swimming on the face, to support the budy, rendered her vier by this elivation of the head, The pheromena of surmoning in this prone position are First the man thong him seef an the surface of the maler, he reflects

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The head from its right line with the 20 body to rearly a right angle, The ligh being he aver than water would sink if he did not contract the murcly of the buck, there by having one of their attachment, to the chest or lightest part and the other to the hips, the latter are elevatio and held at the surface, and con: sequently the hys are kept from sinking to their natural setuction in the lower water. He hands are now slowly stretched aut at The same time the junts of the lower limby are slotely lunt, Then the hands are force : less brought round with the palm approved to the water and at the same moment the ligs are wolently extended, The water years to there impulses, but it cannot yield as fast as they can be moved, and this afference of velocity in the limbs and the

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Jurface for the limbs to preso against, and The hoay manes forward with a helocity devined from this solid pesistance I said that in swimming on the face, with the head and nick out of water, the body has no hay oney con sequently the In overecut is like flying, in which the hoog besides being supported moved forwards ment be supported, and made the made of action in swemming exactly resembles The flight of those wirds which more that The sin by a sucception of curves. as The wast pecker and common yelrow list of the country. For the body lying some what obliquely at the surface, the ligs being a like lower than the chest, when



the water is struck by the feet, the short 22 is pushed forward and and of the water but being in that raised position, much heavier than before, it is brought leach At the water after making a curee on the Surface, which curve is forming whitst the hands and legs are preparing for a new stroke, just then as the head is about to plunge breath in this owner a new thotel is given, and their bry a succession of survey the swimming is continued after this act of swinning on the beast has been acquired, an other made of swins ming on the Back is attempted the this as I have already said could be much more easily ham & than the first -It is done by turning the body on the back

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so that are but the face may be uni 23 : der water, he wision powers of the body is the be beland hear the surface by the exertion of the back and then by the forcible stoke of the but the movement is ofefected, . The save with which the body is supported in the supine position is manfeit from the action of the legs alone being suff. cient for swinming, wheat the arms may be folded or remain at pert, whereas is ruin ming on the breast is impracticable without the exercise of the hands. There is another made of the body in the supine Thatan called Flacting. In this the hoty hists horgantally at the surface, being suppor ted by a maderate mation of the hands, But this support is made at the chest a part

The hours For their support,

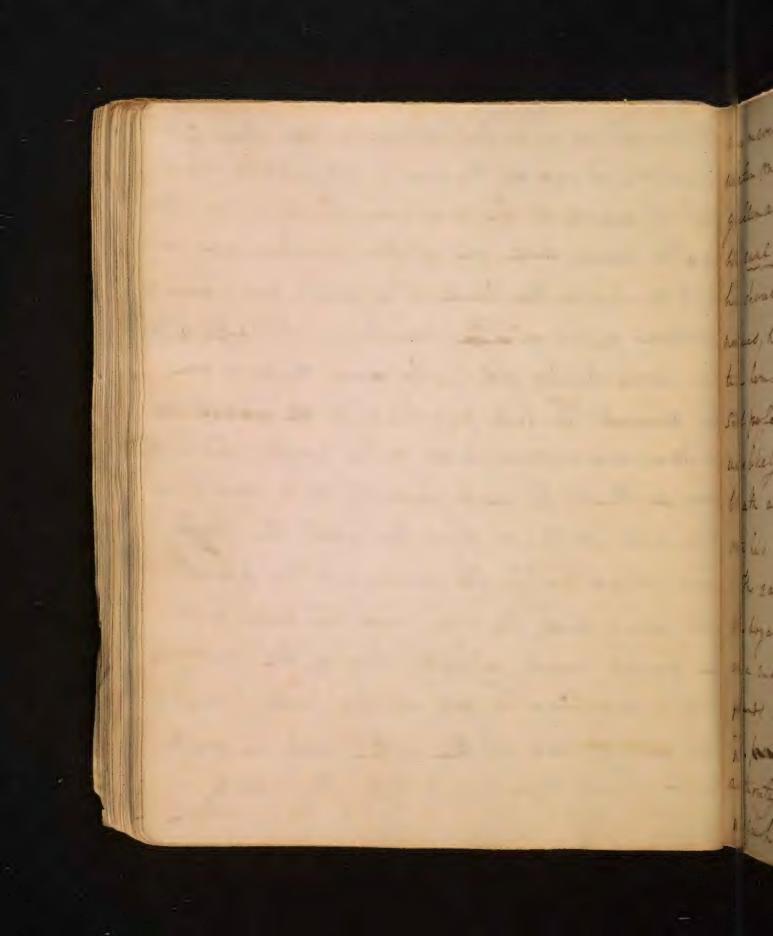
which from its builty has no need of it. 24 The inferior heavy portrong of the body must he upheld by presuring a staffres of the back hips and legs, that they may project by an infractle line from the crest which remains find to the surface by its builty and the mo tion of the hands . - The barteular manage ment of the back I have before spoken of as Sweetial to Swemming on the breast, But to the sale cause of Floating . -I have he and that persons have been able to least well aut using the hands, This a sulety if bosible is cortainly very vanes, and must depin a upon a structure not after to be met with, If a man has a small hence, lange thest slander museles and limbs and much fat, then per aps by merely making that muscular a gidily ne

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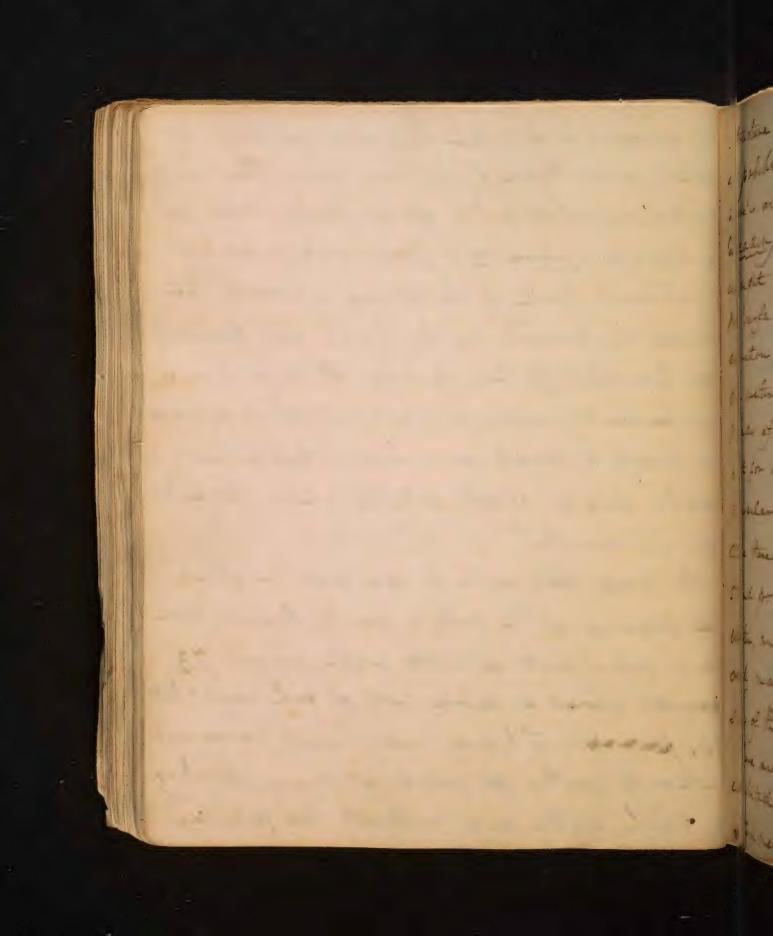
Cepary to keep the body horizontally exten 25 and he might be able to flast for a short times. I say for a short time only for tis impossible to continue long that muscular exertion by which the body must be keept horgonitate. Here is no such thing in a healthy hody and the constant action of a muscle with out a relaxation stil, and the ment valadiralite pains arise from an indeaueur to por some a permanance of Mus Oulan contraction - The only account of Host my withant some exertion of the bady, which Shave met weth worthy of reliance is taken from the Relaxablical transaction, and is as follows . "The Loras of the admirally have appointed for the excreene of the scholans belonging to the rayal academy at Fortsmarth a small yacht whenin awing the summer months those young sentemen are taught the practice

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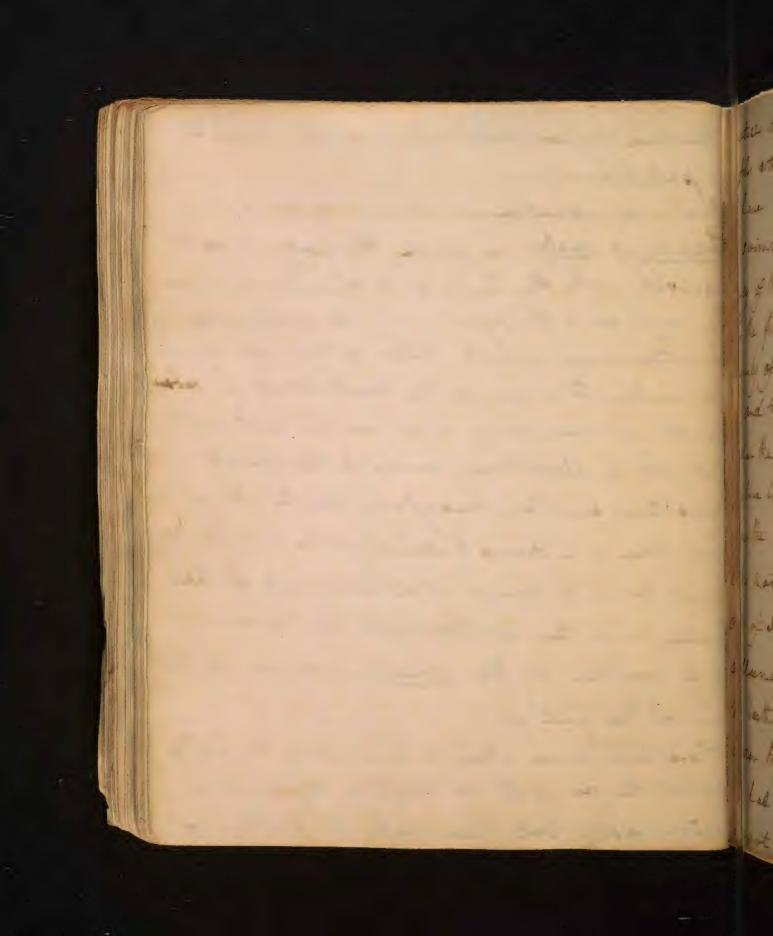
of working a weful at sea under the 25 direction of one of the master attendants asis ted by eight or ten sea men. The but time this yackt was aut one of the scholars was or dered to have the lead, The youth was about thristien years of age conale for his age, and for from being fat; as he was stepsing on the gunnel he fell overbaand; The yest to have he sea was rough and the yacht had great way so that he was presently at a very con siderable distance from the upol. The skiff was immediality be rown, but the painter not being last, the rope sun an end and The boat went adrift. One of the reamon jumps overtiaand, got into the hoat, braught her along seas of the wepl took in another man and then went often the youth whom



they recovered often the Lad been in the 27 water more than half an hour. The young geneleman relating the officer said that as he caula cain very little and judging he should sink if he showe a quent the mesues, he turned on his back and commit ted hemself to their meney. He kept him = Self perfectly own, and absuraced when a wave went to kely to break our sim to hold his break and to short out the water for and Inte his mouth." This care took place in sea water in which the hogancy of the hody is greater than in fresh as a cubic foot of Satt water weight 73 pounds whereas a cubic fatt of our weight but 70. Jacob. . . I have here heard from any authority worthy of oredit, of mans floating in frish water, and wethout the peculiar



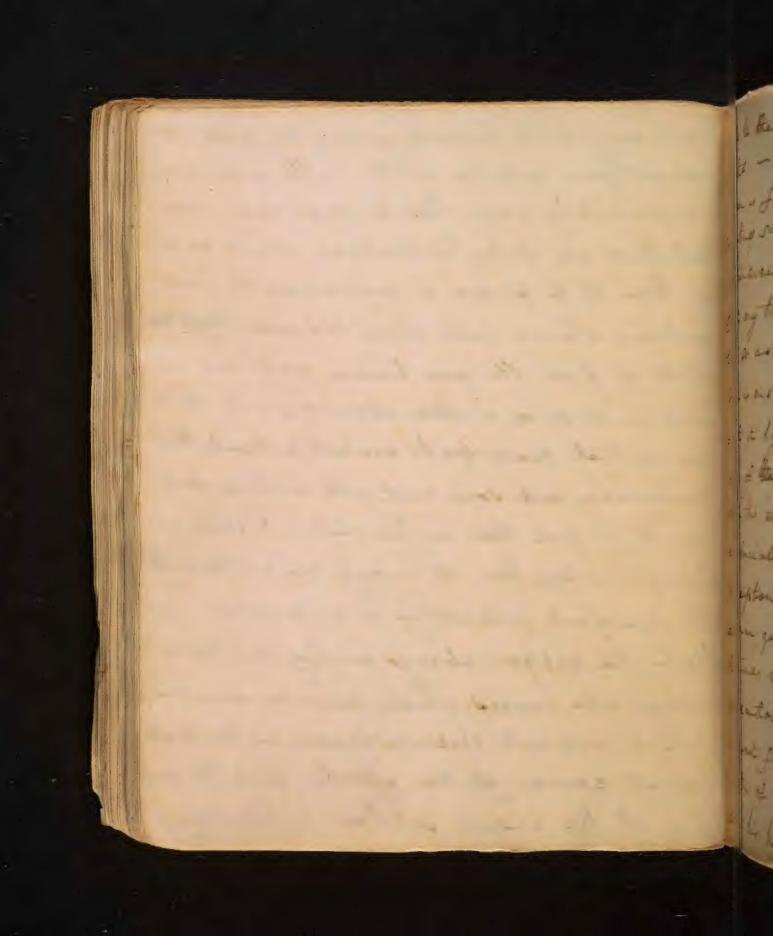
structure before mentioned & do not thin is 28 at popule. There is an aproation of swimming calld Treading water in which the hopy is traft whoight with the head and shoulders above the surface. This effected by the allomate elevation and violent stroke of the fat against the water. It is one of the nort tiresome mist made of swimming and can be continued but for a short time, owing to the great Museular exection necessary for it. For in this care there is a strong trudency of the body to al seemed from so much of it being out of the water, and the nesistance to this diseast is only made in the small surface of the cols of the cut -There are some other movements in the water exhibited as feats of anglay by auxtrius quemmen - But there need no particulas



notice as they are depend on the prin 29 apply which have been laid down . -I have their considered the movietor phenomena of swimming under the true heads of the livery ancy of the holy and Muscular exertion, lin: don the first & painted ant the relation of the granty of the whole hady and its parts to the ma ter, and the position which this coundit to assume. under the last I have shown how the horizontal parture is mantained by murcular exertions and have the body is propelled by it. Solale now take matice of some other particulary of the art of Swimming, which the they are to be caplaind by The privious principles, yet could not besthant a confusing aignifican he brought under the precuding heard. -It had always turn a question, why man cannot swim naturally, when it is done by

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nearly wery brute however young the first 30 time it gover into the weater. - This is common by explained by saying that in man fear fre = - vents that use of his limby which would sup: from if he placed a confidences in his exertions, wheras bruly swim he cause they me author of fear. This view however well not ac count for it since a little attention will in on us that mast brutes are not without this Sprehension, and some mit with violines any attempt to put them in the water Instead of an explination then it is only an instance of that indolent philosophy and acceptine logic which the bulger always employ in their magning often caused, which fines on any ma nifert attendant cereumstance, as the real effecient cause of an effect. But the my tion is of the easiest solution by attending



only to the different of muchany of them and 31 Man is formed to walk erect on a firm resuling surface with the centre of his growity surpin accular to the have on which he moved, of at any time that performaceularity should be last so as to indicate his falling forward There is motantly an indeavour made to present it by throwing the fact forward that the line of the gravity may fall within them. and this intention and the consequent motions is associated by long habit with the bart. perception of a tendency to fall. how when a man goes into the water who cannot down he finas himself sinking or falling. The andy mee aution he has been in the habit of using gainst falling is to bring his feet under the centre of gravity at the same time to throw, ant his hands to some the concepion of

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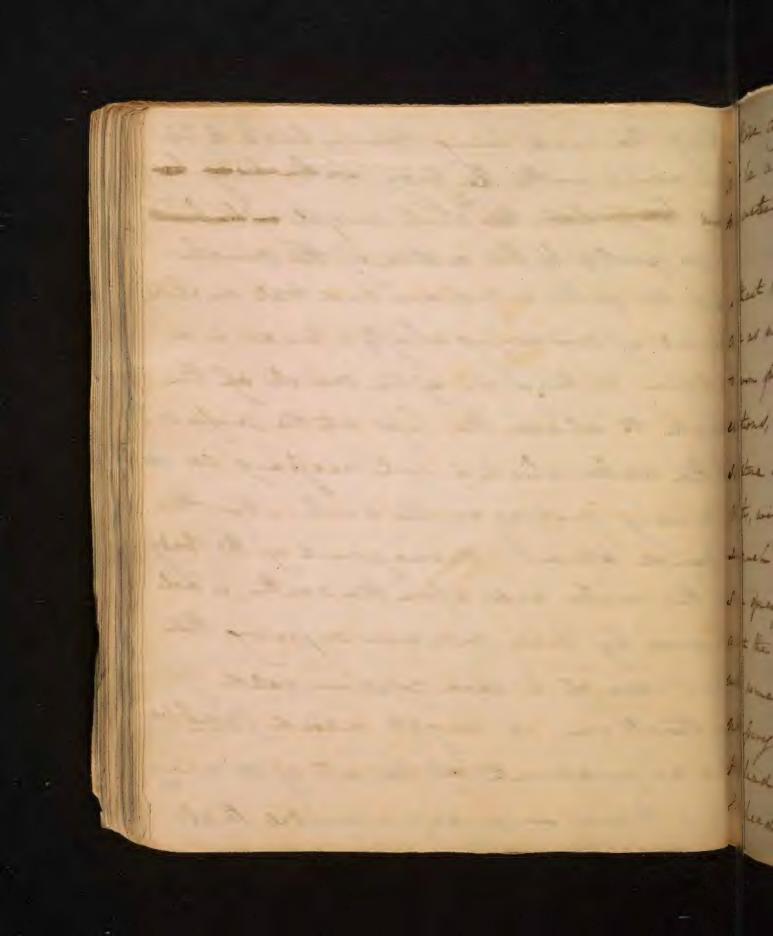
the body. This mode he at once has he 32 curre to, but it is a view endeavour for softy, as throwing the feet forward under the centre of gravity brings him to the upright position, and this as we have before seen is the least abountagious for support, in the wa to - The makes violent exertions with his feet and this with the upright position he has now afound, puts him agastly in that state desen bed under the head of treading water and This we know cannot be continued even by The most expect swemmer for any length of times. The consequence is that he is unable as in treading water to make not progressive mount and becoming soon inhunted by his exertions, he sinks wheath the surface in suffacated in Such being the parties in man ofunes when he goes with the wester and us this pasition results from his structure

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and Labits, we may jurther see how there 33 Same causes prevent his practicing the proper motion for sweeming the first time he has accasion for them. - For summing bequires encreined of the body opposite in every respect to the habitual exchange it is Mans usual mation is made he are upright pasture, in Swemming it is horizontal . In walking or summing on the earth, the light are moved attendaly, in the water they are moved together constituting a leap. In walking the hands are pendent and intrate with no excetion, across the holy In swine ming they are moved with great labour me a manner apposite to their former di rection, In weeking the head is supported by the filler of home of the back and mick and not by Muscular former, In swin

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Ming the head being thrown back to 34 an angle with the body, and the day by the whole wight of the is supported by the action of the muscles But the great distinction and that on which the art of suring chiefly depended is cicertain contraction of the musch of the back, to relain the hips at the surface of the water, which is not needs any for the ordinary motions on the earth. - how this difference between the management of the body in the wester and whom the carther, is not known by man, and even supposing the Knowleage of it were communicated by in struction, it might made a facilitate the acquirement of the art of swimming The without some experimental heals



of those different motioned he would 35 not be able to support himself on the water -But Brute, we know swim without this justination and experience and as we have sun that man is unable to swim from his structure and ordinary exections, a little consideration of the structure and ordinary exertions of Soutes, will suform us why they swim with So much cade - Bruty have many the Same specific gravity as man. consequently about the same relative portion of the body will remain above the water. But it is necessary for life that the same part in each the head, thould be above the surface. The head is the heaviest part of mun

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where the head of buty is compare: 36 lively lighter since there is less brain in foro fortion, the bones of the head are more Spangy and there is a greater envely weither the james and in the nostrily. Buty Then have an advantage oven mon in the boyon ay of the parts of the body But they have besides other advantages, for the neck and head being longer they more carrily thetch the latter to the surface of the water for resperation. The usual postson of the mek and head hung horzontal, the and not supported by the back home as in man they are famished with a string tit of mus de to support it without fatigue, therefore that elevation of the head which is mans greatest meanunienea, is not felt by brutey . - . The contre of gra

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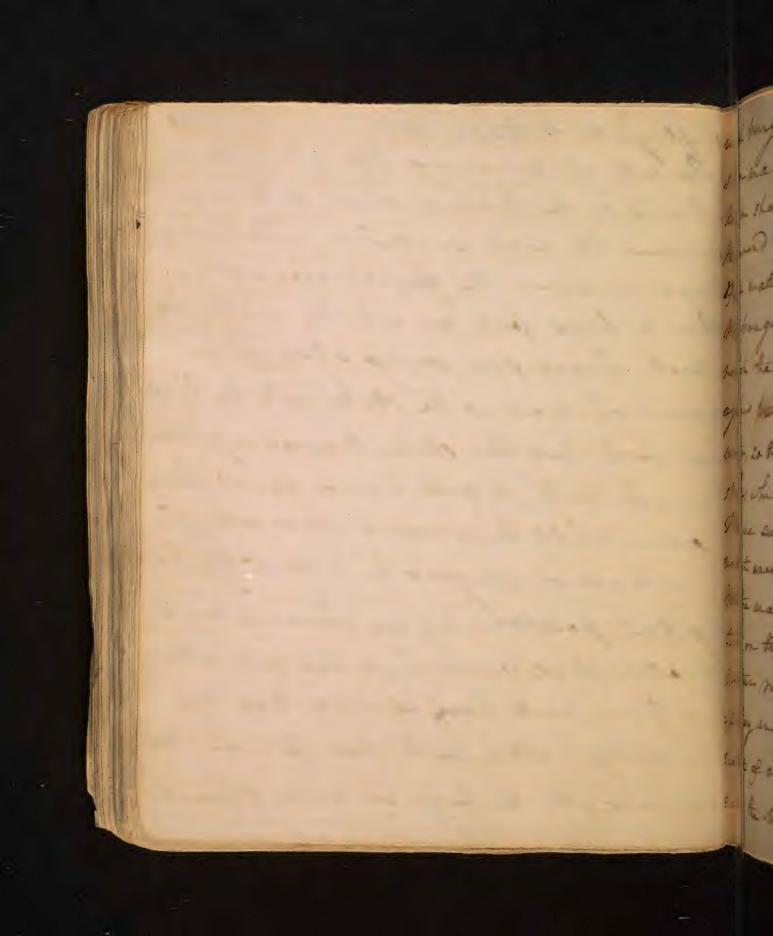
vity of bruty is about the brock part ? of the chest, so that when the own into the wa to they naturally take a position with the , legs a pendant and the head upright che only the same of their position on the coutte. In the second point then or in position the trate has the advantage over man for since this is the same in his body that he has been wed to, it is only needs any to make a Fight extreme of the head and neck to he in the true posteres for progressive swine ming - But mon mutte make a puriful elevation of the head and a raid com: haction of the hack and hips. as negards the third point on the muscular excition for the swimming of bruty the obrantage is more considerable, me have sun how ma my difficulties man had to incountries.

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in this part of the function But in 38 brutes the motions are all the same that he is habituated to on earth, he has only to welk tho the water to move forward. Thus whilst men have so many things to beam defend from their usual habits; brutes have only to learn to shotch the head to the surface of the water, and this the me = cefity of be athing teacher them the moment They fall into it: I have said that a knowledge of the theory of swamming or the means by which it is effected would fucilitate the acquirement. of the art, but alone would not be sufsecunt with aut the infunce of triats in The weater. This suggests to us the consideration of the made in which the art is aggin hed and the means that one occasionally

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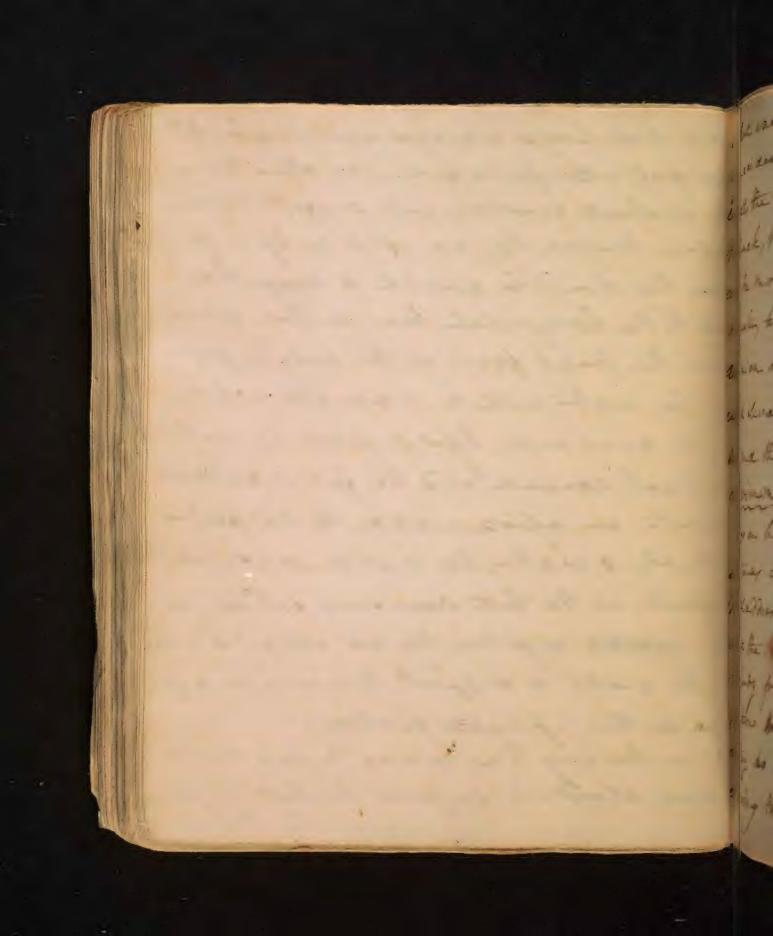
employed to trach it. The art of Swimming like all other arts is hand in the tediand school of many failures, the each successive intervair brings it neaver the Berfect execution, When a hosp forct goes into the water, he is well aware from swing others, of the manner of making the stoke with the hunds and feet, but this stoke however regular by made will support him or enable him to swim, whilst he remains ignorant of the method of bringing his body to the ho. rigorital position. any one who remanders his first attempte at swimming, or has seen other bays learn must have absenced that they medially catch with their fut at the water here ath the body or centre of gravity



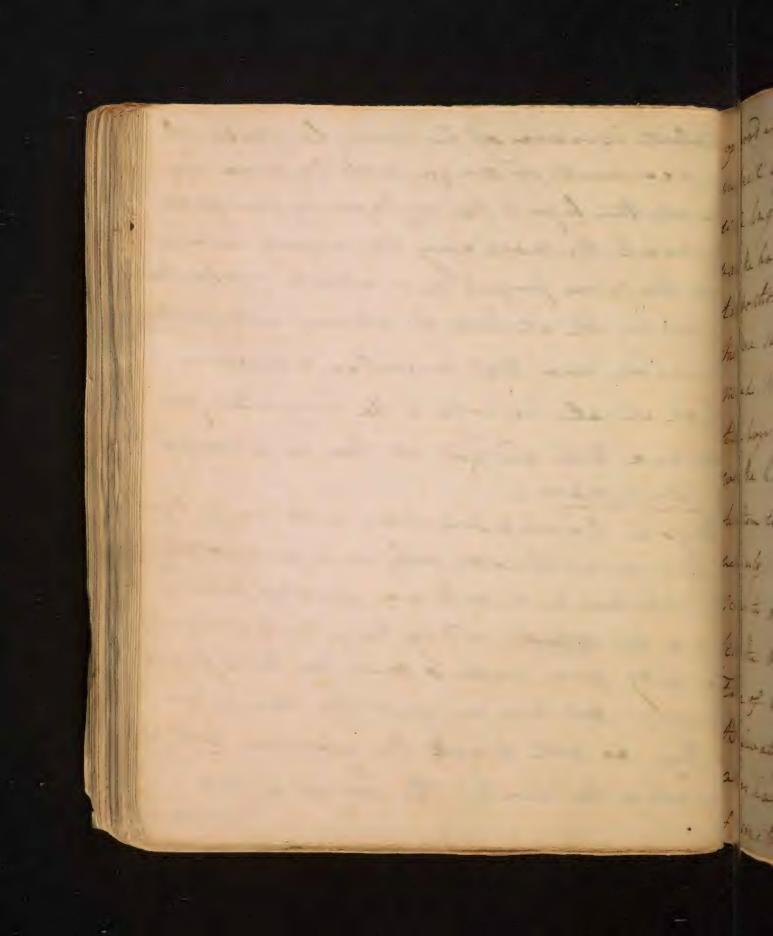
which brings them to the upright po = 40sition, and as the art is always underthe Ren in shallow wester, The feet soon touch the ground and the attempt is at an end. If the water be so sup that the fact when thus brought under the hady count he ach the bottom, the woright position it apurous puts it into the state of theading water, so that after the few rapid and beolest strokes which this pasture requires, to sinks -Thus we see hoys having to swim make very violent exections and yet make no progress The the waits - They are generally toto as instruc tion on there accasions to be more moderate in their motions, and that they will do witten if they are not so rapid. There is great want of observation in this remark, For ex: cost the hody he in a different position

tet - Marie hit a y olen 1 2 the target 1 the 如花 3. to 100 2. E sm. of last on the n way Wit = of least 1 have in the 一是 il all

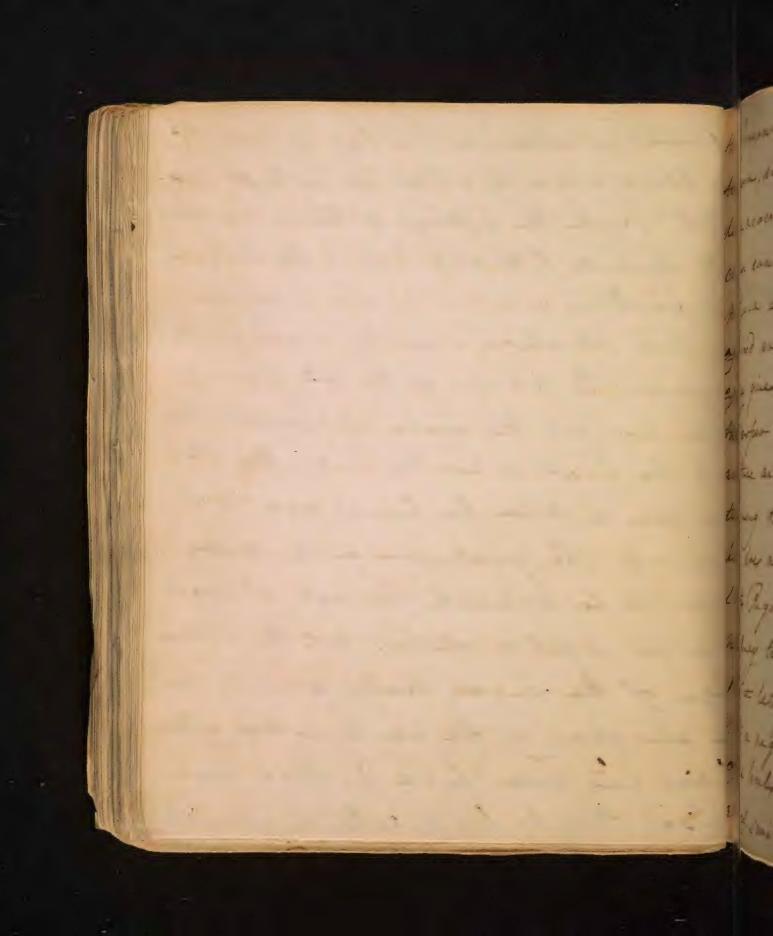
from that buys always assume when 41. they first attempt to swim, no other than this violent exertion will suffort them, Before therefore they are teld to be lip impor : turns they should be directed to maine the hip to the hosizantal line, for then alone when the brand front of the body is pressing on the water will a moderate action of the arms and ligo suffices. For with the back converte and the gut dependant or with an aproximation to the pasture of the aling weather, the motion must be riscart, as the best swermmen exhibit, in The porcible impulses they are abliged to make in the water to support themselves for a short time in this upright position -Often the bay has made many imour in spul allentes to support him self by this



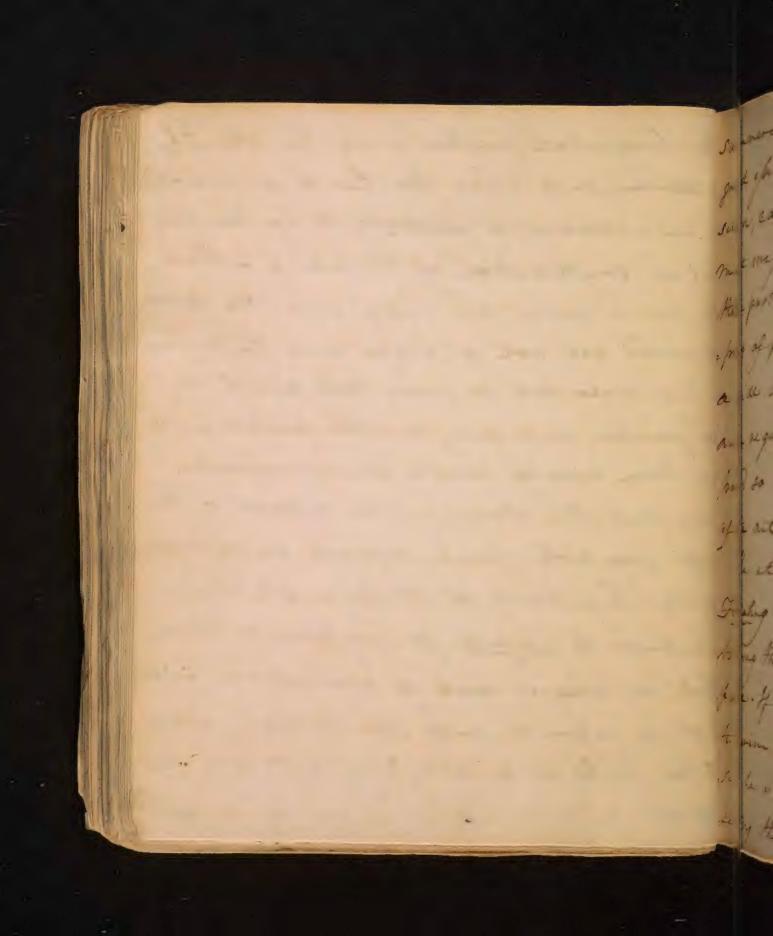
prolent energiese of his limby, he finds 42 by accident or assign, that the more he elevates the hips to the surface by strong thing The back, the more easy the support becomes and the more progress he is able to make the The water, that at last he attains a complete. dominion over that muscular management which devotes the body to the horizontal por time, and then and not lite then he be comed a dwimmer. Bays in learning sometimes make use of hypot substances as bladdy, cortes and precus of wood The bladders and corks one usually placed about the chest and by their living prevent the body from senking even in the uproport positions. Hat there are generally slow aids as they do not teach the effectial art of elevating the back. The use of a long



of wood is better. For the hay laying 43. his breast whom it whelse it extends his whole lingth, the lightness of the wood ele: vate the hade, hips and legs to the horizon tal position, and teacher him to retain The same situation when the mood is he = moved. The tracker of the art generally take buye into the neater, and support them with the hard under the bady, they then the them to strike the hands and fact. pegularly. The great sime of this made seems to be to leach the art of coma King the regular stoke. But the arran tage of the made really everity in the elivation of the back, so that often a boy has been held in that forthon for some time by his maste, he apociates



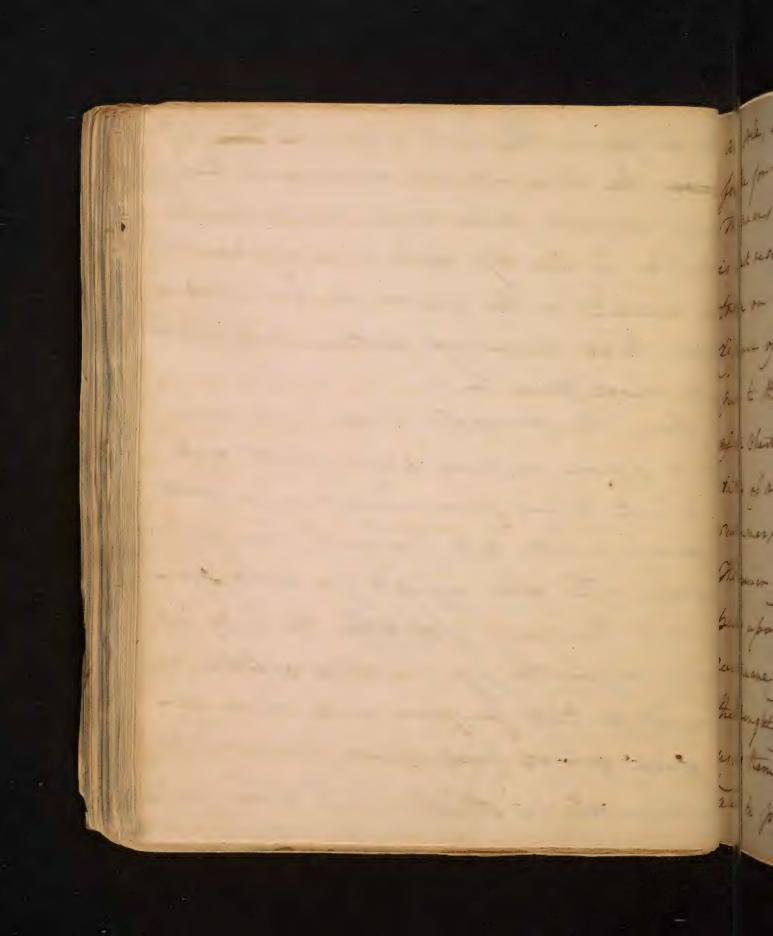
Ahi, horizantae partura with his attentite to swim, and when the Land is removed he in acareary to preserve it by the mus oular eartaction of the back . Thus the hand under the body and the force of wood are not of revice from the voyan by they give, but be cause they direct to the proper and maypendible posture. I hor are there aids of much consequence in tracking the stroke, as the support of the hody day not much depend on its regul larity. Regularity of stroke is aly obelily hecefoary to rapid progrepius motion But it betrays want of absenvation, to say that a regular and sunchonau action of the limby is a necessary metace to the att ef swimming, since we see in good



Swimmers who are masters of the 45 great eputial for the art, the flat poe sition, can support themseller with the mark impular motion of the limby. and Home partieres they go Alwargh for the dis: : play of feats of distirity, one made by a wide departure from that parablesome and regulacity of shoke which are suff. and so meestary for the acquirement of the art. in The act of swining on the back and Flasting are acquired also by learning to bring the leady horizontall to the sur face. If me alience a boy attempting to swim on the buck or float, me See he is not marter of this art of pro: secting the hody along the sustace, for

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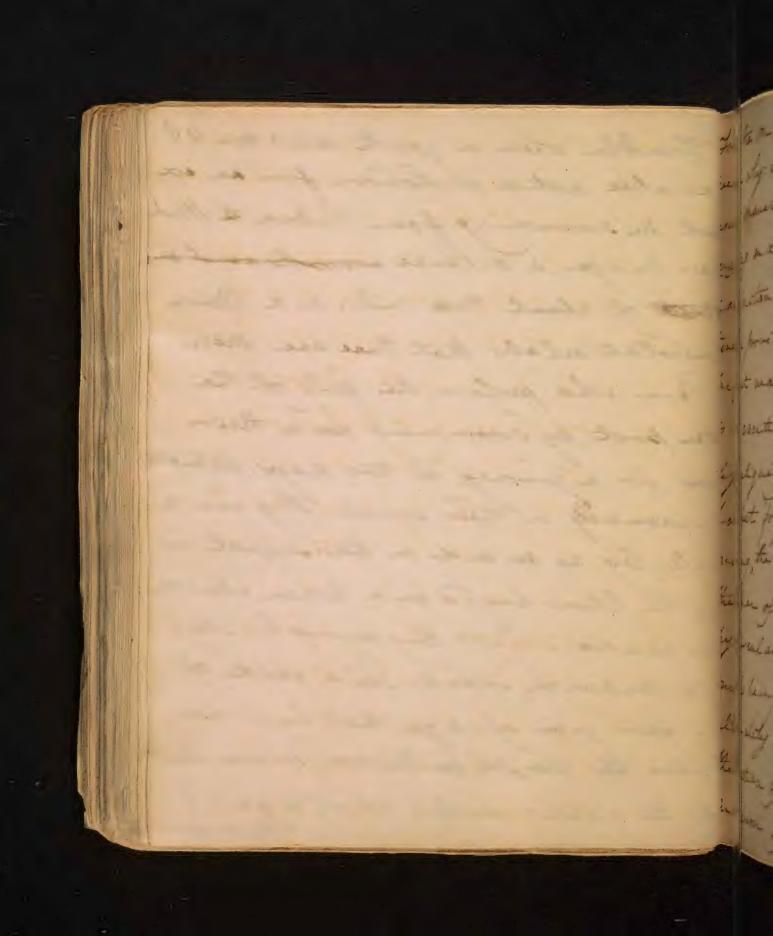
The he purher the fut above the the 40 for, the hips remain sunk and the hady curved, and as in this oursed parties he has les extent to appare to his account in the water, he can man tain that planting partine but for a very short time. I From the principles which have been laid down me may early point ant by win at. no and snewmening may be most topidly made and langest borne wethant fatigue - The first requirte for rapid swim ming is Buoyancy, for when the body is early supported, les muscellar existion is required for that purpose and more can be given for its progressive novement. The requisite in structure is a broad palm



and sole, and great muscular power 47. for the for the forcible excreise of there. -The me and in position is that in which then is hast resestance which is when the brogis thown on one side in its progress, for the difference of resistance will be then just a: qual to the deference of breath and depthe of the Chest - and I am told that the son diand of our country who are expents swimmers we the sixe method hatitually The power of swemming a long time, as penas upon the same principles as the long Continuance of any other Muscular excition the strength of muscles and the habit of wing them. Some men from habit are able to postorm great enestions in this

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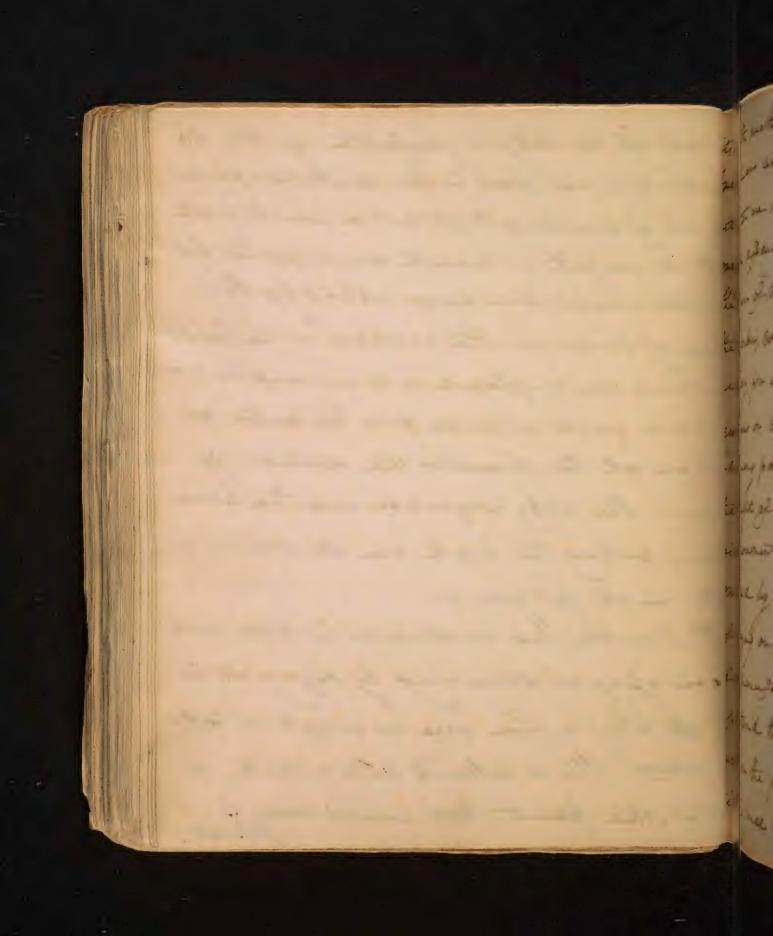
Dr. Franklin when a youth areco con 48 se acrable notice in London from an ex place in swemming from Chelsea to Black prian bridge, a distance acrosile as de colour of about three mily, and Baron. Aunicolat relates that three are men in ere who perform the duty of the letter part by ownering down their severe for a journey of two aays, risting accanonally in their overse. They we a small log as an aid in their support, and carry the letters bound in a turban abuct. Hein header - Cape King awing his stay at the Sandwich islands som a child of only four years of age, that had been accedentaly over set in the see, swim about with the greatest disclosing lett it me gains the boat.



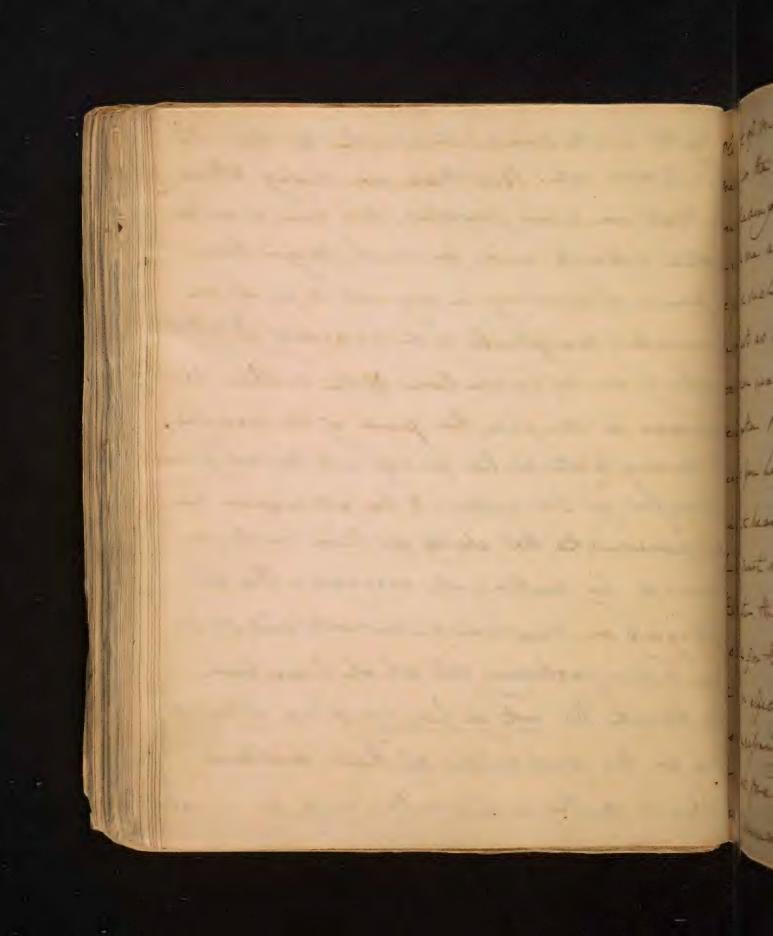
From the motion recessary in swemming 49. we see why that exercise is so time some. The usual thousment of mon an the earth is walking. In a in this was see one of the abun: aant instances of the wise sconony of nu: tune in providing for the most necessary and frequent mants of animals. For so small is the exection of walking that it is much before fatiguing than standing equally on walking the weight of the body is horse by the pillar of home of the linely and very title by muscular exection. The only action of the muscles being the tilling the centre of granity alternality on the aboanced ligs. But the action of the links in the water is a succession of based, in which the whole

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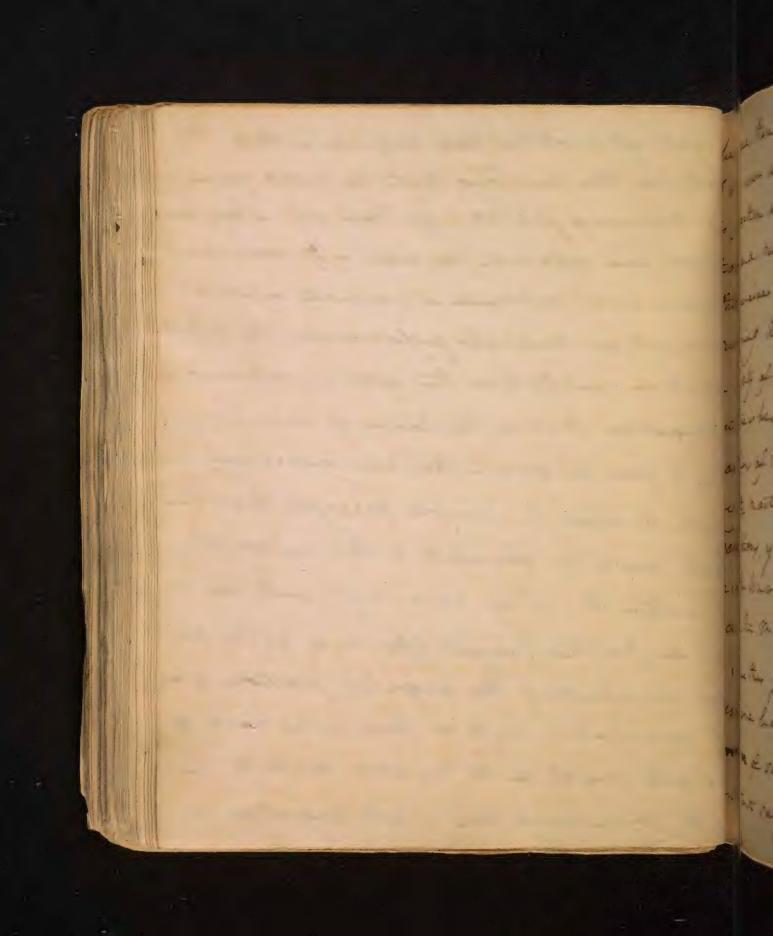
weight of the body is profeeled by the 50 muscly whereas such is the contriornes of The art of walking that not a fourth part of that weight is moved or supported by them, the remain are being who held by the pillar of hone. - The exertion of the hards too which are employed in removing the we ten at a great distance from the centre of motion at the shandary, the westian of Ruping the hody horzontal and the labour in supporting the head, me all attended weith great fatigue. Ar Tranklin hus concluded his tollto prace treal essay on swimming by saying the is an art which when once acquired is never forgetter, This is retired with a time of attentie paint, that would seem to himil



its truth with some triumph to this 50 peculiars act. But there are many other arts that are never forgotten the hamd with greater difficulty and in much longer times. The pawer of memory in any art aspends on the mumber, complexity and napedity of motion necessary for its execution. If the mations be numerous or complex, the power of the memony over many parts of the process will be lost from the weight of the hurden, If the art nequine no grid movements, the ability for them must be presenced by continual exercises - The art of playing on musical instruments; and some of the manufacturing arts which have been aptly termid the arts of handling one often for gotten in the particulary of their asstrans aitail, since the wast number and manual



steeght of motion their requires in two 51 great for the memory, but the more giveraland leading practice of theme art, when once be and are retained for over . - If swimming be onise a such viticate and smart infinite marament as musical performance, the skilful execution would like this after an outermlyour be forgatter. But if the theory of swemming guen to you be correct, the memory is only me quired to bear this simple precept, that the back must be elevated to the surface of the water. This may and surely will be se toined for the longest life. and as the mo thous for effecting this horyvatal position one not necessarily rapid there is no need of constant practice to mesure autify. The not of Swemming then is not forgetter my



because there is telle to be remembred. 5-2 I have never heard that the art of Skating is forgation and yet the unaccustomed mo tions and management of the budy for this exercises are more numeraus than for swimming. as in it there is a necessity for a regedity of musely to presure the position but there is besides a necessity to retain the me Callechon of the variations of the centre of gra vity, the mart delicate perhaps of our badily perception, yet when this art is once a equi sed the knowleage of it is indelible brained ed on the memory. -I have they gentlemen mae anound to exhibit to your some bading views of the Thong and art prostees of swimming. If I cannot call it an important subject for your consideration of

Ramans .. "necit nec litteras nec natare." · 6 m : 1

and practical be reliated from the whole com: palo of Phisiology, since every mon has some pleret in it. - The ancients, whose political institutions inculeated and required the proc ties of athletic arts used to say in contemp: trans represent of the afective advantion of any one that "he know neether his letters nor have to Swine. The campus marting set Rome was chosen on the borders of the Lybur that the school and sports of the pela and water might be united and relief afforded to the aust and sowor of their daily drill. Our ames do not command the necessity of an eaucation in this art, and the it may be ques: tioned wether the name accasions which occur of preserving life by it, should make it are man pousible part of instruction, more than

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many other arts of equal which which 54 are not universally taught - yet it becomes an abject of interest and curiasity to all, the attempts that one universally made other through use fulness or pleasure to acquine it is It is a triumph of madern seionce which. the ancients neither affected or gained, that the intillectual efforts of phelosophers have been turned to those practical eshours that limbit the moral the political and phisical star. tion of man. The intillective in auting of antiquety was washed in the variety of its pur suit; and the admirer of its literature, its is alestract reiences and Elegent arts, muit aplace the lop the world has sustained from the multipress of much of its philosophical labour. We look with wonder on a people

of John eii ma Eti luta an Fiston and a ferrance or many = a much for the sail na file The plat of Spl tien, a is low ma Hill ? El phrie us filin. the webst Mr. ha - A profess me wall m le tre 6. 2a =

who could confuse its religion with myste 53 seism, and deform its secure by the enquiry often first and unsearchable causes, and at the same time with flagrant inconsistincy sedes to a confession of the want of christianly, and afronemate to the sublines inventions of Liebrity and of Newton. This neglect of the highest aim of science its practical applications, was not the result of it, necessary progress the early steps of inhecility, since anchemides a: quality skill in theoreties and practical knowledge has lift his apinion that the practical and mechanical bino of seines were beneath the mind, and that the retie and abstract pursuity were the goolise employment. of man. and whilst he has given to partirily whole books on the properties of Curry he has made no mention of Thase wonderful arts by which he presend his country soon all the attacks of a skilful and powerful energy. He paid a fatal tribute to his abstract particular a type to the world of the fatality that must

await the scientific pursuit of man in a universal reliance on this belief in in James Rush Philadelphia October 1815

